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peculiar twists a screw movement tending upwards, or at any rate in a direction that is perpendicular to the plane of rotation. This last stage of improvement, so far as we at present know, was effected in Australia only, and not in those countries into which, in its simpler form, it had been previously distributed by the migration of tribes. The Egyptian, African, and Dravidian boomerangs may not have been independent inventions, therefore. The boomerang being a weapon of very primitive construction, and its present distribution being coincident with the distribution of some of the black races of man, it may with great probability be regarded as one of those weapons which primeval men carried with them into distant parts from the home of their ancestors, wherever it was. In speaking of the distribution of this weapon, writers should be careful to note that the Egyptian boomerang, the trom-bush of the blacks of Abyssinia, and that of the blacks of Hindostan, correspond only to one class of the Australian boomerang, — viz., that used by them for war, and considered to be the most useful weapon they employ, — and that this differs from the returning boomerang, which has a lateral twist by means of which it is caused to rise in the air, screwing itself up precisely in the same manner as a boy's flying-top, which rises and spins against the ceiling, — (*Journ. anthrop. inst.*, xii. 454.) J. W. P. [1181]

Hittite inscriptions.—So many attempts to decipher the Maya hieroglyphs have been based upon the processes that have led to brilliant results in Egyptian and Mesopotamian inscriptions, that we are not surprised to find an author deciphering Hittite by means of Aztec phonetic values. Prof. John Campbell of Montreal has in press a volume on the history of the Hittites, their migrations, antiquities, and language, in which will appear translations of some of the inscriptions first discovered by Mr. Drake in 1871. A pamphlet of sixteen pages, however, precedes the volume, giving the translations. Briefly, the author believes that the Hittite empire, overthrown in 717 B.C., was re-established successively in India, north of the Altai, north-east of China, in Khitan, Manchuria, Saghalin, Corea, and Japan, and finally as Aztec, Peruvian, and Chibcha, on the American continent. Mr. Campbell, therefore, has only to give to the characters of Hamath resembling those of Mexico their Aztec phonetic values, and the thing is done. — J. W. P. [1182]

EGYPTOLOGY.

Geography.—The vast field of ancient geography yet to be explored is indicated by the fact that two thousand names of places outside of Egypt, mentioned in the geographical lists, still await identification. Brugsch points out some necessary cautions. 1°. The different systems of orientation. The Egyptian always imagined himself as standing face to the south: the east was on the left hand, the west on the right hand, and the north behind him. The African made a point, between the Nile and the Red Sea, east of Ethiopia, the place from which he judged of the relations of countries: hence to him Ethiopia was in the west, etc. The Asiatic faced the east, and spoke of it as before him, the west as behind him. And the Egyptian monuments represent, sometimes one, sometimes another, of the systems in giving the relations of the same place. 2°. The Egyptians very frequently translated and did not transcribe foreign names. It has often been remarked that the names of nations well known in pre-classic antiquity, and with whom the Egyptians were well acquainted, are not found on the monuments. These names must

be sought in the Egyptian translations. 3°. The Egyptian geographical lists, in their enumeration of African peoples, proceed from south to north: among Asiatic nations they proceed from north to south; i.e., in both cases they follow the downward course of the great rivers.

Brugsch believes that Punt was a southern land, not in Arabia (where most place it), but in Africa, and that the Egyptians sent expeditions thither at a very early period in their history. Hommel (*Vorsemitischen kulturen*, 1883, p. 108, 421) thinks these expeditions began about 2450 B.C. — (*Revue égyptol.*, iv.) H. O. [1183]

NOTES AND NEWS.

The remains of the late Professor Charles Frederic Hartt, who is well remembered for his extensive scientific researches in Brazil, arrived at New York from Rio de Janeiro on June 7 last, by the steamer Finance. They will be carried to Buffalo, N.Y., the home of Mrs. Hartt, for interment. Over five years have now elapsed since the death of this distinguished naturalist and linguist, whose life was so faithfully dedicated to the cause of Brazilian science. Completely worn out by the drudgery of official cares in trying to perfect the organization of which he was the chief, against the jealousies of a foreign and unappreciative people, he fell an easy victim to that most dreaded of all Brazilian scourges, yellow-fever, which afflicted so many Americans during the early spring of 1878. His grave in the protestant section of one of the larger Rio cemeteries has borne no other mark than the customary number by which it could be identified. While Brazil has neglected the memory of one who more than any other gave character and purity of purpose to its scientific undertakings, his own country will not fail to do him homage.

—The Report of the chief of ordnance, U.S.A., 1882, contains some important matter relating to the science and practice of gunnery. Col. Crispin makes a long and valuable report on European ordnance. The methods of construction of British and French ordnance are described, and the advantages of malleable over cast irons are exhibited. The now familiar effects of tempering in oil, as practised in British gun-making establishments, are described. Soft steels having a tenacity, untempered, of thirty-one tons per square inch are given a strength of forty-seven tons by oil-tempering, their elongation being, meantime, reduced somewhat by the process. The reporting officer concludes that the direction of change is toward the introduction of built-up forged guns, or built guns of cast steel, and that the future is to see the introduction of this principle carried to its limit in guns made of coiled wire, as proposed by Treadwell of Cambridge, and recently by Woodbridge, — a conclusion manifestly at variance with the results described in his report as attained by Whitworth with solid guns of compressed steel. The principles upon which Whitworth is working

are summed up by that inventor as "strong, ductile, and sound materials, strong, quick-burning powder, short guns, long projectiles, and rapid rotation." Lieut. Birnie's conversion-tables for metric measures are included in this volume. They are substantially the same as those issued by the Messrs. Wiley, together with Noble's British tables, and other matter from Thurston's Materials of engineering. Cpts. Michaelis and Greer discuss the deviations of projectiles mathematically. The report is supplied to libraries and scientific departments by the chief of ordnance.

— De Candolle's 'Origine des plantes cultivées' has received a searching review at the hands of Professor Asa Gray and Mr. J. Hammond Trumbull in the *American journal of science*. The book itself is as valuable to anthropology as it is to botany, and it was fitting that a competent representative of each of these sciences should be associated in its examination. The reviewers, however, in this case, seem to have had a definite object ulterior to that of merely appreciating this last great contribution of the venerable phytologist. The claims of America as the original source of a large number of the best-known vegetable products of the globe required to be defended; and they deliberately assumed and performed this task, showing in a large number of cases that De Candolle had either ignored or had not duly weighed the evidence that exists in favor of their American origin. The comprehensive and critical learning displayed in these articles, relative to the mention of these plants in the early history of American discovery, is only equalled by the shrewdness and force with which it is marshalled in support of the views which the writers feel called upon to set forth and sustain.

— 'Progress in meteorology, 1879-81.' This useful contribution to the English literature of meteorology has been published by the Smithsonian institution under the editorship of Professor Cleveland Abbe of the army signal-office. It consists, as the author expressly states, of extracts, mostly from the Vienna *Zeitschrift* for the years 1879, 1880, and 1881; and this accounts for the notices from the German of two papers originally published in this country. Biographical notices of eminent meteorologists who died in the interval covered by this pamphlet, a concise description of the work contemplated by the Polar commission, and an account of the meteorological work in hand and proposed by nearly all the different governments, are given. Under well-arranged heads, such as bibliography, methods, apparatus, etc., chemical and physical properties of the atmosphere, solar radiation and terrestrial temperature, movements of the atmosphere, barometric pressure, electricity, magnetism, and optical phenomena, will be found abundant material for study, and of the later scientific investigations in the protean subject of meteorology.

— The Worcester county, Mass., free school of industrial science is now completing its fifteenth year. It offers free instruction to students, who, at the time they enter, are residents of the county. There is a further endowment by the state for twenty free scholarships for students elected by the board of education. The school is by no means a local institution, a large number of the boys coming from outside Massachusetts. At present there is great need of an increase in the accommodations of the chemical and engineering departments. The friends of the institution are bestirring themselves, and have issued a pamphlet stating the results of the school's work up to this time, and the urgent need there is for further room, that the growth of the institution may not be cramped. The mechanical department, possibly the most thriving, has received, within the last two or three years, greatly increased facilities, but is pressed to the utmost to fulfil the demands upon it.

— At the meeting of the Engineers' club of Philadelphia, May 19, Mr. C. G. Darrach exhibited two profiles from Tiffin, O., to Lake Station, on the southern bend of Lake Michigan. The surveys were made for the Baltimore and Ohio short line to Chicago, — one *viâ* Napoleon, and the other *viâ* Defiance, O. About 240 miles of surveys were run, and the profile and maps plotted in sixty working-days, with a party of eight men.

At the meeting of June 2, Mr. Carl Hering read a short article on electrical units and formulae; Prof. L. M. Haupt exhibited a drawing of the Phoenixville bridge, which was built by Mr. Moncure Robinson, C.E., in 1836, for the Philadelphia and Reading Railroad, over the Schuylkill. It is an instructive and enduring monument of successful construction of cut-stone masonry. There are four segmental arches 72 feet clear span, and 16½ feet rise; radius of arch, 47½ feet; vousoirs, 2 feet 9 inches thick. One end abuts against a rocky bluff, whilst the other is supported by a heavy abutment with an earthen filling. It is believed to be one of the lightest and cheapest bridges of its kind in this country, having cost but \$48,000. The secretary exhibited samples of Japanese paper, which he had obtained through Mr. J. A. L. Waddell. Many Japanese papers are of excellent quality, and could probably be used with great advantage in engineering practice.

— Van Nostrand has published, as one of the excellent 'Science series,' a book of logarithms to four places, of logarithmic and natural functions. The tables seem to be very well arranged, especially those of the natural functions.

— Dr. Ralph Copeland, editor of *Copernicus*, writes to that journal in the latter part of February last, from La Paz, Bolivia, 12,050 feet above the level of the sea, —

"For the first time for ten days, the sky is tolerably clear, and remarkably dark, although the moon is al-

most exactly full, and at an altitude of some 30° . At 9h. 30m. local mean time, to test the clearness of the air and the visibility of fifth and sixth magnitude stars, I made a naked-eye sketch of the Hyades and Pleiades, which were also roughly at the same altitude as the moon, but considerably more than 90° distant from her. In the Pleiades I distinctly made out ten stars, — D. M. $+24^\circ$, 553 and 556, both of 7.0 magnitude, being seen as one star; and D. M. $+24^\circ$, 546, of magnitude 6.3, being clearly visible. In the head of Taurus I made out seventeen stars, two of which — D. M. $+16^\circ$, 586, and $+16^\circ$, 605 (of 6.0 and 5.0 magnitude) — are not in Argelander's *Uranometria nova*. I also saw σ Tauri plainly double.

"As it is now near the close of the rainy season, I hope shortly to be in a position to report something of what can be done with a six-inch refractor at 14,360 feet above the sea-level. My station is at Vincocaya, between Arequipa and Puno. In the mean time I am endeavoring to obtain the height of the Ilimani."

— Dr. Ralph Copeland, editor of *Copernicus*, writes to that journal in the latter part of January last, from Lima, —

"At Chorillos, near this, are staying M. Barnaud, Lieut. de Vaisseau, and M. Favreau, Enseigne de Vaisseau, members of the French Venus expeditions to Chili. Chorillos is the landing-point of the cable from Valparaiso and Panama. The French astronomers, in conjunction with two colleagues now at Valparaiso, are determining the difference of longitude. They have two-inch transit instruments, with chronographs and chronometers; and the cable is led directly into the observatory. The instruments are similar at both stations, and the observers do not interchange stations; but the personal equation has been determined for wire-transits, and signals transmitted by Thomson's galvanometer. The strength of current is adjusted by a rheostat to a constant strength. A triangulation will connect Chorillos, Callao, and Lima, distant some six or seven miles from each other. The connection of Valparaiso with Buenos Aires on the one hand, and with Callao and Panama on the other, will complete the circuit of the greater part of South America; the chain from Greenwich to Buenos Aires, through Lisbon, Madeira, St. Vincent, Pernambuco, Bahia, Rio Janeiro, and Montevideo, having been finished by Lieut.-Commander Green, U.S.N., in 1879."

— The first *livraison* of *Les nouvelles conquêtes de la science*, par Louis Figuier, is devoted to a sketch of the application of electricity to lighting. Judging from the sample of explanation given in the introduction, where the glowing of a conductor is attributed to the accumulation of an electric fluid, it cannot be said that the book promises to give a straightforward statement of facts without embellishment. The illustrations are numerous and attractive. Very much of

the same untrustworthy character is the first *livraison* of *Nouvelle histoire des voyages*, par Richard Cortambert. Both of these books are for sale by F. W. Christern, New York.

— Prof. C. S. Sargent has recently prepared a striking statement of the loss, actual and prospective, suffered from forest-fires, and of the necessity of stringent legislation for their prevention. Especially should this loss be brought to public attention in New England, where so much surface is adapted only to forest-growing, and whence a great share of our white pine must come in future years. These states already possess valuable forests of second-growth pine, now reaching a size when they can properly be thinned out, leaving the smaller trees for future need. But in Massachusetts alone, ten thousand acres of forest are on the average burned annually; about one-third of the fires beginning from locomotive sparks, and nearly all the rest from easily avoided carelessness. This burning not only destroys the standing trees; it makes investment of capital in growing forests hazardous, it checks the growth of a very desirable industry, and it destroys the capacity of the ground to continue a pine growth. When properly cut, a pine forest may be propagated indefinitely. When burned, there is a long succession of weeds and briars, mountain cherry, gray birch, willows or poplars, maples, and ash-trees, until a hard-wood growth is established. This maintains itself for a long time if left alone; but if the ground be then cleared by cutting, cultivated for many years, and then left free from plough and scythe, and guarded from pasturing and fire, the white pine will spring up spontaneously after its long absence. Fifty or one hundred years must pass before this desirable crop returns. In view of so long a delay, and of the considerable value that pine will soon command, it is well that special care should be given to protecting and preserving the second-growth forests now approaching maturity.

— The national congress of the French geographic societies will meet this year at Douai, seat of the Geographic union of the north of France, on Aug. 26, for a week's session. Excursions will be made to Calais and other points on the channel, and to Charleville, and across the Ardennes to Belgium. A geographic exhibition is proposed in connection with the meeting.

— M. de Lesseps recently stated to the French geographical society that the work on the Panama canal was going on in good condition. Excavation has been begun all along the line. Two American machines had just been received, capable of digging three to four thousand cubic metres a day. The work is in charge of the chief engineer '*des ponts et chaussées*,' sent out from France by the canal company some months ago. The Algerian canal, in which M. de Lesseps is interested in connection with M. Roudaire, now, he says, stands a good chance of

receiving government concessions, in spite of the adverse report made by the Academy of sciences last year.

— The Entomological society of London, the second of its name, held its fiftieth anniversary last month; and, in his presidential address upon the occasion, Mr. J. W. Dunning suggested that Professor Westwood of Oxford be made titular life-president of the society. "An original member, he has never failed us. During the crucial period of our childhood, he was the motive power, the life and soul, of the society. For fourteen consecutive years he was secretary, and for part of that time he was curator also. The council has seldom been complete without him, and during six years he was our president. Whilst he resided in or near London, he rarely missed one of our meetings. Even Oxford cannot keep him away from us; and there is not a single year, from first to last, that he has not been a contributor to our transactions." This proposal was carried by acclamation.

— The unusual competition for the last 'Walker prize' of the Boston society of natural history induces the society to offer the same subject for next year's competition; viz., 'Original unpublished investigations on the life-history of any animal or plant.' While the partial treatment of the subject is permitted, preference will be given, other things being equal, to memoirs which embrace the whole life-history of an animal or plant from the early embryological stages to the adult form.

The society also offers, through the generosity of a member, for next year, a special first prize of from \$60 to \$100, and a second prize of \$50, on the following subject: "A study of the venation of the hind-wings of Coleoptera, with illustrations of all the families of Le Conte's and Horn's classification." Essays in competition for both prizes must be sent to the secretary of the society before April 1.

— Over four hundred members of the British association have already pledged themselves to attend the meeting at Montreal in August, 1884. It is believed that all the permanent officers of the organization will be present.

— We learn that a series of fifteen original letters of Alexander von Humboldt to his intimate friend Wegener, bearing the dates 1788–90, is for sale in Germany. They have been made use of for the biography of Humboldt by Bruhns; and extracts have been more than once published, — most recently, in the Berlin journal *Gegenwart*, nos. 30 and 32, of 1882, — but they have never appeared in full. Any institution or private person desiring to acquire them should apply to Dr. G. A. Saalfeld, Hobsminden, Germany.

— In the weekly summary ¶ 1075, line 20, instead of 'acid,' read 'pentachlor- and hexachlor-compounds.'

In the 'Weather in March,' p. 388, for 'Fallstown, Ind.,' read 'Fallstown, Md.'

RECENT BOOKS AND PAMPHLETS.

American apiculturist, The. A journal devoted to scientific and practical bee-keeping. Edited by S. M. Locke. Vol. I., nos. 1–2. Salem, Mass., *Locke*, May–June, 1883. 48 p. 8°.

Anderson, J. Scotland in pagan times: the iron age. The Rhind lectures in archaeology for 1881. Edinburgh, *Douglas*, 1883. 332 p. 8°.

Basset, J. Anthony. Latitude and longitude, and longitude and time, embracing a comprehensive discussion, with over one hundred illustrative questions and problems. Syracuse, N.Y., *Bardeen*, 1883. 50 p. 16°.

Blackburn, T. True and false issues between christianity and science. London, *Skeffington*, 1883. 12°.

Box, T. A practical treatise on the strength of materials, including their elasticity and resistance to impact. London, *Spon*, 1883. 530 p. 8°.

Briart, Alphonse. Principes élémentaires de paléontologie. Avec 227 figures. Mons. *Baudry*. 12°.

Buck, J. H. W. A graphic table for facilitating the computation of the weights of wrought iron and steel girders, etc., for Parliament and other estimates. London, *Lockwood*, 1883. Large sheet.

Cotterill (Bishop of Edinburgh). Does science aid faith in regard to creation. London, *Hodder*, 1883. 226 p. 8°.

Dessoliers, H. De l'habitation dans les pays chauds. Contribution à l'art de l'acclimatation. (Alger) *J. Baudry*. illustr. 8°.

Dresler, E. F. Flora von Löwenberg in Schleswig; nach dem natürlichen system bearbeitet. Löwenberg, *Köhler*, 1883. 162 p. 12°.

Eclectic complete geography, The. Cinc. and N.Y., *Van Antwerp, Bragg, & Co.*, 1883. (New two-book series.) 114 p., illustr. 4°.

Haeckel, Ernst. A visit to Ceylon. Translated by Clara Bell. Boston, *Cassino*, 1883. 8+337 p. 16°.

Hoffman, Carl. Botanischer bilder-atlas nach De Candolle's natürlichem pflanzensystem. 1 lief. Stuttgart, *Thieme-mann*, 1883. 8+6 p., 6 colored lith. 4°.

Klein, E. Elements of histology. London, *Cassell*, 1883. 364 p., 181 illustr. 12°.

Maynard, C. J. Manual of taxidermy; a complete guide in collecting and preserving birds and mammals. Boston, *Cassino*, 1883. 16+111 p., illustr. 16°.

Mohnike, O. Blicke auf das pflanzen- und thierleben in den niederländischen Malaienländern. Münster, *Aschendorff*, 1883. 4+694 p., illustr. 8°.

Philanthropist (*pseudon.*). Physiological cruelty; or, fact and fancy. An inquiry into the vivisection question. London, *Finsley*, 1883. 8°.

Reis, P. Die periodische wiederkehr von wassernoth und wassermangel im zusammenhang mit den sonnenflecken, den nordlichtern und dem erdmagnetismus. Leipzig, *Quandt & Hündel*, 1883. 8+124 p., illustr. 8°.

Remelé, A. Untersuchungen über die versteinierungsführenden diluvialgeschiebe des norddeutschen flachlandes mit besonderer berücksichtigung der Mark Brandenburg. 1 lief. Berlin, *Springer*, 1883. 152 p., illustr. 4°.

Roche, T. C. How to make photographs: a manual for amateurs. Edited by H. T. Anthony. New York, *Anthony*, 1883. 91 p. 12°.

Sherrerd, J. M. Iron analysis record; with a complete table of atomic weights, their elements and symbols, with the old and new system. Troy, *Young*, 1883. 12°.

Souchon, Abel. Traité d'astronomie pratique, comprenant l'exposition du calcul des éphémérides astronomiques et nautiques. *Gauthier-Villars*. 8°.

Step, Edward. Plant-life: popular papers on the phenomena of botany. N.Y., *Holt*, 1883. 12+218 p., illustr. 16°.

Taber, G. L. The fisheries of the Adriatic, and the fish thereof. London, *Quaritch*, 1883. illustr. 8°.

Tayler, I. The alphabet: an account of the origin and development of letters. 2 vols. London, *Paul*, 1883. 752 p. 8°.

Thiersch, H. W. J., and Thiersch, A. Die physiognomie des mondes. Versuch eine deutung derselben im anchluss an die arbeiten von Mädlar, Nasmyth und Carpenter. Augsburg, *Preyss*, 1883. 4+43 p., 4 lith. 4°.